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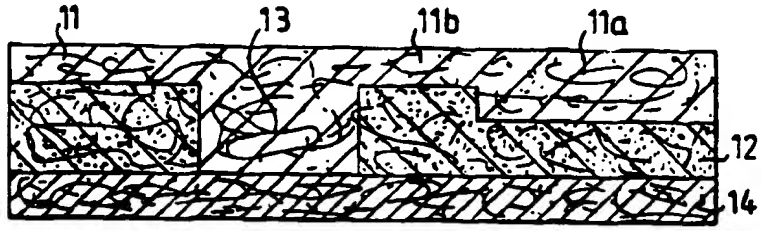

(57) Abstract

Absorbent body in an absorbent product such as a diaper, incontinence pad, sanitary napkin or the like, and which comprises a liquid acquisition portion (13; 11, 13) and a liquid storage portion (12) adjacent thereto. The liquid acquisition portion has at least one well (13) which is located at the assumed wetting area of the absorbent body and extends into and through the liquid storage portion (12) and is in liquid communication with a liquid wicking layer (14) arranged under the liquid storage layer (12). The material in the liquid acquisition portion (13; 11, 13) has a mean pore size which is greater than the mean pore size in the liquid storage portion (12). The absorbent body has a high instantaneous absorption even during repeated wetting and a low rewetting.

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Absorbent body in an absorbent product

Technical area

The present invention relates to an absorbent body in an absorbent product, such as a diaper, incontinence pad, sanitary napkin or the like and comprises a fluid acquisition portion and a fluid storage portion adjacent thereto.

The background of the invention

An absorbent body for absorbent products such as disposable diapers, incontinence protectors and sanitary napkins is usually constructed of one or more layers of hydrophilic fibres, e.g. cellulose fluff. Furthermore, so-called superabsorbents are often included, which are polymers with the capacity to absorb many times their own weight in water or bodily fluid. Furthermore, additional components can sometimes be included in the absorbent body in order to improve, for example, its fluid spreading properties or to increase its coherence and ability to resist deformation during use.

A major problem, primarily in adult diapers and incontinence protectors intended to receive and absorb relatively large quantities of fluid, is that they often leak before their total absorbent capacity is completely used up. Since during urination, large quantities of fluid are often expelled during a few seconds, it is not uncommon that this results in the absorbent body being temporarily locally saturated with urine in the so-called fluid acquisition zone, when there is not enough time for the urine to be spread out to the other portions of the absorbent body and thus any more urine expelled will leak out of the diaper. Such early leakage is, of course, a great source of irritation for both the user and his

caretaker. The leakage problem is accentuated upon repeated wetting.

Another problem is keeping the surface facing the user as dry as possible during the entire use and preventing so-called re-wetting, i.e. that already absorbed fluid is pressed back out of the absorbent body and wets the skin of the user or gives rise to leakage. To a certain extent, this re-wetting problems are alleviated if the absorbent body contains superabsorbents, which chemically bond the absorbed fluid even when the product has been subjected to external pressure, for example when the user sits down. One difficulty is, however, to design the absorbent body in such a way that the fluid is spread from the wetting area to unused portions of the absorbent body.

International patent application PCT/SE92/00078 describes an absorbent body comprising at least two different cellulose fluffs, the fibre structure in the first absorbent layer substantially consisting of a first type of fluff with an open fibre structure and low liquid dispersability, for example a cellulose fluff made chemo-thermal mechanically, and a fibre structure in the other absorbent layer essentially consisting of a second type of fluff with higher liquid dispersability than the fluff in the first absorbent layer, for example a chemically produced fluff. The first layer can, by virtue of its open fibre structure, house much liquid between the fibres and therefore can receive large amounts of liquid during a short period of time, i.e. it has a high momentaneous liquid absorbtion capacity. The other layer, which has a higher liquid dispersability than the first layer, is able to drain liquid from the first layer and spread it to the other layer.

EP-A-0,254,476 discloses an absorbent body, which in one zone essentially in front of the wetting area, has a lower surface weight and a lower density than the surrounding portions of the absorbent body. This provides an area with high momentaneous liquid absorption capacity, whereafter the liquid can be dispersed and stored in the surrounding areas of the absorbent body.

GB-A-2,082,643 describes an absorbent body with an essential uniform surface weight but with a density gradient in the longitudinal direction, so that the density increases towards the short sides of the absorbent body. This provides rapid liquid admittance in the central portion of the absorbent body out towards the more compressed end portions.

US-A-4,413,996 describes an absorbent body for a diaper having a liquid absorbing depression or well in the wetting area. In this well, a porous batt can possibly be arranged.

There is, however, still room for improvement as regards liquid absorption capacity and dispersability, especially in products intended to be able to receive large quantities of liquid during a short period of time, which is often the case in, for example, incontintence products for adults. Another goal is that the surface of the absorbent body facing the user must be felt to be dry and comfortable, even after repeated wetting.

<u>The purpose and essential features of the invention</u>

The purpose of the present invention is to provide an absorbent body of the type described by way of introduction, which fulfills the goals, i.e. which can rapidly receive large quantities of liquid even upon repeated wetting, and disperse the liquid by wicking towards the unused portions of the absorbent body, and which also has

a high surface dryness. This has been achieved by virtue of the fact that said liquid acquisition portion comprises at least one well located at the assumed wetting area of the absorbent body and extending depthwise into and through the liquid storage portion and is in liquid communication with a wicking layer arranged under the liquid storage layer, and in that in the liquid acquisition portion, there is arranged a first absorbent structure, which has a first effective mean pore size, and that in the liquid storage portion, there is arranged a second absorbent structure which has a second effective mean pore size which is less than the first mean pore size.

Description of drawings

Fig. 1 shows a plan view of a diaper as seen from the side facing the user.

Fig. 2 shows a plan view of an absorbent body in the diaper according to Fig. 1.

Fig. 3 is a section along the line III-III in Fig. 2.

Figs. 4 and 5 are corresponding sections but through alternative embodiments of the absorbent body.

Fig. 6 shows a plan view of another absorbent body.

Fig. 7 is a section along the line VII-VII in Fig. 6.

Fig. 8 shows a plan view of still another absorbent body.

Fig. 9 is a section along the line IX-IX in Fig. 8.

Fig. 10 shows in the form of a stack diagram the momentaneous absorption of an absorbent body (B) according to the invention and another absorbent body (A).

Description of examples

The diaper shown in Fig. 1 comprises a liquid permeable cover layer 1, for example of fibre fabric or perforated plastic film, a liquid impermeable cover layer 2, for example of plastic film or hydrophobic fibre fabric, and

an absorbent body 3 enclosed between the two cover layers 1 and 2.

The diaper is intended to enclose the lower portion of the user's torso as a pair of absorbent pants. It has a rear portion 4 intended to face the rear of the user, a front portion intended to face the front of the user, and a narrower crotch portion 6 between the back portion 4 and the front portion 5. In order to be able to join the diaper together to the desired pant shape, tape tabs 7 are arranged adjacent the rear waist edge 8 of the diaper. The tape tabs 7 are fixed when used against the exterior of the front portion 5 of the diaper, close to the front waist edge 9, thus holding the diaper together about the waist of the user. Other fastening means, such as Velcro®, hooks and the like are of course also conceivable.

Furthermore, the diaper according to Fig. 1 comprises pretensioned elastic means 10, which can consist of a suitable material, such as elastic foam, elastic tape or thread-wound elastic cords. For the sake of simplicity, the cords are shown in Fig. 1 in their extended state. As soon as the tension is released, the elastic means will contract and thereby form the elastic leg bands of the diaper.

It should be pointed out here that the diaper shown in the drawing and described above is in no way a limiting example. Thus, the shape of the diaper as well as its other design features can be varied. For example, for diapers intended to be worn inside a special pair of fixing pants, the fastening means, i.e. the tape tabs 7, can be eliminated as can possibly the elastic means 10 as well.

With reference to the example shown in Fig. 4, the absorbent body 3 of the diaper is composed of a number of different parts. Essentially directly in front of the assumed wetting area of the diaper, which is the area of the diaper which is first struck by the emitted urine, and which is usually displaced somewhat towards the front portion of the diaper, the absorbent body 3 has a liquid acquisition well 13 which extends into and straight through a surrounding liquid storage layer 12. The well 13 can rapidly receive great amounts of liquid during a short period of time. Beneath the storage layer 12 and the well 13, there is a wicking layer 14 consisting of a fibre material with high liquid dispersability.

The fibre material in the well 13 can consist, for example, of cellulose fibres of mechanical pulp, thermo-mechanical pulp, or chemo-thermo-mechanical pulp, so-called CTMP. These pulps have relatively coarse fibres with remaining lignin, and therefore they have relatively large pore volume, high wet resiliance and low liquid dispersability. High wet resiliance means that the fluff pulp essentially retains its structure even after wetting. Other fluff pulps with similar properties can be used, for example southern pine or chemically stiffened cellulose fibres, as well as synthetic fibres.

According to the example shown in Figs. 3 and 5, there is arranged on top of the storage layer 12 a cover layer 11, which together with the well 13 forms the liquid acquisition portion of the absorbent body. The cover layer 11 and the well 13 can, as shown, be integrated with each other and thus consist of the same material. They can, however, also consist of different materials, both of which should, however, have the desired properties, such as relatively large pore size, high wet resiliance and low liquid dispersability. The cover layer increases the surface dryness of the absorbent body.

The cover layer 11 has, in the embodiment shown in Fig. 3, a thicker rear portion 11a, as seen in the position of use of the absorbent body, said thicker portion changing, at a certain distance from the well 13, preferably 5-50 mm, to a thinner portion 11b. The thinner portion 11b has a higher density than the thicker portion 11a and therefore functions as a liquid barrier preventing liquid from being spread towards the rear portion 11a of the cover layer 11, which is thus kept dry. An additional advantage is that urine and faeces are kept separate from each other. Mixing of urine and faeces results in the formation of undesirable decomposition products, which can cause skin irritation. The well 13 can, of course, also be completely surrounded by such a barrier 11a of the cover layer 11. The higher density of the portion 11b is automatically obtained by compression of the absorbent body, thanks to the reversed thickness ratio of the underlying storage layer 11, presupposing that it has a higher resistance to compression than the cover layer 11. A compressed barrier strip 11b next to the well 13 can of course be achieved in other manners.

The example shown in Fig. 4 lacks the cover layer 11.

According to the example shown in Fig. 5, there is between the well 13 and the wicking layer 14 a liquid acquisition layer 19. This should consist of a material with a high liquid receptability and wet resiliance, i.e. it should retain an open fibre structure even in a wet state. Examples of suitable materials are synthetic fibre material, e.g. in the form of a wet, polymer form material, cellulose fibres of mechanical pulp, thermo-mechanical pulp, chemo-thermo-mechanical pulp (so-called CTMP) or chemically stiffened cellulose fibres. The layer 19 can also consist of a material which swells upon wetting, e.g. compressed dry formed sheet pulp.

The fibre material in the storage layer 12 should substantially consist of fluff pulp or other fibre material with relatively small pore volume and high liquid dispersability. Fluff pulps made chemically, which consist of fine fibres of essentially pure cellulose, have in general good liquid dispersability. Even fluff pulp of, for example, CTMP compressed to a density of over about 0.12 g/cm^3 has relatively good liquid dispersion properties.

Another material with good liquid dispersion properties is compressed dry-formed sheet pulp of for example CTMP or chemical pulp. Such materials are described in WO 90/0508.

The fibre material in the wicking layer 14 should consist substantially of chemical fluff pulp, dry-formed sheet pulp according to the above or other fibre material with good dispersion properties.

The density in the liquid acquisition portion 11, 13 should be between 0.02 and 0.2 g/cm^3, and preferably between 0.06 and 0.15 g/cm^3. The density in the storage layer 12 should be between 0.1 and 1.0 g/cm^3, preferably between 0.12 and 0.6 g/cm^3. The density in the wicking layer 14 should be 0.08-1.0 g/cm^3, and preferably 0.12-0.6 g/cm^3. The density values given above apply for absorbent bodies of cellulose fluff pulp. For other types of absorbent materials, other densities can be suitable.

The difference in pore size between the liquid acquisition portion 11, 13, on one hand, and the storage layer 12 and the wicking layer 14, on the other hand, can be achieved by a difference in density between the layers, but even at the same density, but with different types of fibre materials, the desired pore size difference can be achieved.

The liquid acquisition portion 11, 13 contains between 0 and 30%, preferably between 2 and 15% of superabsorbent, computed on the total dry weight of the portion. The superabsorbent, in the form of flakes, fibres, granules, powder or the like, is preferably mixed with the fibre material, either substantially evenly distributed or in such a manner that certain portions can contain a higher proportion of superabsorbent than others. Its purpose is to absorb and bind any liquid which remains in the liquid acquisition portion 11, 13, even after it has been drained by the storage layer 13 and the wicking layer 14. This provides a dry surface closest to the user, since the spaces between the fibres in the liquid acquisition portion 11, 13 are essentially emptied of liquid.

The superabsorbent in the liquid acquisition portion 11, 13 should have a high gel strength, so that an open fibre structure is retained in this portion even after wetting, and it is an advantage if it has a relatively low absorption rate. The liquid acquisition portion 11, 13 can of course be completely free of superabsorbents.

The storage layer, as well, preferably contains super-absorbent, between 2 and 80%, preferably between 10 and 50%, computed on the total dry weight of the layer. The superabsorbent in the form of flakes, fibres, granules, powder or the like is either mixed with the fibre material or applied in the form of one or more layers between the layers of fibres. The superabsorbent is either evenly distributed in the storage layer 12 or with varying concentration across the length and/or thickness of the absorbent body.

It is also conceivable to have as a storage layer 12 an essentially pure layer of superabsorbent.

The superabsorbent in the storage layer 12 has preferably a high absorption capacity under pressure, i.e. a capacity to swell essentially uneffected by normally occurring compressive forces, in order to not block or impede the dispersion of liquid. What characterizes these superabsorbents is a high degree of cross-linking, which makes them more difficult to press together in comparison with a gel with a lower degree of cross-linking.

The storage layer 12 can, of course, also be completely free of superabsorbent.

The wicking layer 14 is preferably free of or contains very small amounts of superabsorbent.

The exuded body liquid, in this case urine, can be rapidly absorbed by the liquid acquisition portion 11, 13, and be spread either directly or or via the wicking layer 14 onto the second absorption layer 12, where it is stored. The difference in capillary size between the fibre materials in the liquid acquisition portion 11, 13 and the storage layer 12 creates a suction directly from the liquid acquisition portion 11, 13 towards the storage layer 12 or the wicking layer 14.

The liquid acquisition portion 11, 13 is drained of liquid and is prepared to receive the next dose of liquid. The storage layer 12 has a capacity for storing several doses of liquid.

The well 13 can have varying shape and size. It is important, however, that it has a portion which is located in the assumed wetting area of the absorbent body, i.e. is displaced toward the front portion thereof. The well 13 can extend transversely to the absorbent body out to the longitudinal lateral edges 15, 16, as is shown in Fig. 6, or terminate inside them, as is shown in

Fig. 2. In both of the examples, the well 13 is located only in the front portion of the absorbent body and terminates slightly inside its front edge 17. It is, however, conceivable that the well 13 extend up to the front edge and that it even extend somewhat into the rear portion of the absorbent body, possibly to its rear edge 18.

According to an additional variant, the absorbent body has two or more wells. Such an embodiment is shown in Figs. 8 and 9. An advantage of having several small wells 13 instead of one big well is that the wetting area of a diaper may vary depending on whether the user is lying or sitting and it also varies between males and females. With more than one well the risk that the urine will strike the absorbent body outside the well is reduced. A small well is also more rapidly drained from liquid than a big well, which is a further advantage. The wells may also have different sizes in different areas of the absorbent body.

The absorbent materials described above have only fibre based structures. It is, however, possible according to the invention, to use other types of porous absorbent materials, such as polymer foams, for example polyester, polyurethane, polyolefines, viscose, etc., or porous polymeric macro structures. The desired pore size difference between the liquid acquisition portion and the storage portion can be achieved simply with such materials as well. Even combinations of fibre and foam materials can be used.

By pore size is meant here the effective mean pore size which the structure has in dry state. A measuring method for determining and measuring the effective mean pore size in a fibre structure is described in EP-A-0,470,392. An alternative embodiment involves the use as a liquid

acquisition portion, especially as a well 13, a hard compressed material, which expands when wetted. Repeated wettings will thus give it an expanded and increased pore volume. Examples of such materials are compressed dry formed sheet pulp, compressed structures of chemically stiffened cellulose fibres and compressed thermal bound fibre structures, where wetting breaks the thermal bonds and the structure is allowed to expand.

A few comparative tests are described below comparing an absorbent body according to the invention with an absorbent body without a well 13.

Examples

The instantaneous absorption and rewetting were tested for two fluff pulp bodies A and B 10 x 28 cm, each consisting of an upper layer of CTMP pulp of soft wood, a storage layer located thereunder of chemical pulp of soft wood and thereunder a dispersion layer of chemical pulp of soft wood. The upper layer of the sample body A contained 1.2 g of superabsorbent, essentially homogeneously mixed with the fluff pulp fibres, while the upper layer of the sample body B contained 0.8 g of the same superabsorbent, essentially homogeneously mixed. The surface weight of the upper layer in the sample body A was 400 g/m^2. The surface weight in the upper layer in the sample body B was 200 g/m^2. The sample body B had a well of the same material and density as the upper layer. The well had a cross-sectional area in the form of a circle with the diameter 9 cm. The mean density of the sample body B in the well area was 0.07 g/cm^3, while the mean density outside the well area was 0.11 g/cm^3.

The storage layer in the sample body A had a surface weight of 600 g/m^2 and a density of 0.125 g/cm^3. Immediately thereunder, i.e. between the storage layer and the wicking layer, there was supplied a layer of 4.5

g of superabsorbent. The surface weight of the wicking layer was 300 g/m^2. The mean density of the sample body A was 0.2 g/cm^3.

The storage layer in the sample body B had a surface weight of 500 g/m^2, a density of 0.125 g/cm^3 and contained 4.6 g of the same superabsorbent as the sample body A, essentially homogeneously mixed into the fluff pulp. The wicking layer in the sample layer B had a surface weight of 250 g/m^2.

Instantaneous absorption

Four additions of each 60 ml of liquid (0,9% NaCl solution) were made at a certain time interval. The time it took until all the liquid was absorbed was measured (visual observation). The result is shown in Fig. 10 in the form of a bar graph. The sample body B had a substantially better instantaneous absorption than the sample body A, especially at the second, third and forth wetting. The sample body B retained its rapid instantaneous absorption during the repeated wettings.

Rewetting

The rewetting was measured just before the forth liquid addition by a filter paper being placed over the wetting point and being loaded with a weight of 1.1 kg (2.8 kPa) for 15 seconds. The filter papers were weighed before and after the loading and the rewetting was noted. The sample body A had a rewetting of 3.5 g and the sample body B had a rewetting of 2.3 g, i.e. there was a lower degree of rewetting for sample body B.

In conclusion, the tests show a significally improved instantaneous absorption, especially upon repeated wetting, for the sample body containing the liquid acquisition well according to the invention. Furthermore, it had a lower rewetting. Thus, the invention has

achieved an absorbent body with very good absorption properties.

CLAIMS

1. Absorbent body in an absorbent product, such as a diaper, incontinence pad, sanitary napkin or the like, said absorbent body comprising a liquid acquisition portion (13; 11, 13) and a liquid storage portion (12) adjacent thereto, c h a r a c t e r i z e d in that said liquid acquisition portion comprises at least one well (13) located at the expected wetting area of the absorbent body, said well extending depthwise into and through the liquid storage portion (12) and is in liquid communication with a liquid wicking layer arranged under the liquid storage layer (12), and that in the liquid acquisition portion there is arranged a first absorbent structure, which has a first effective mean pore size, and that in the liquid storage portion (12) there is arranged a second absorbent structure which has a second effective mean pore size which is less than the first mean pore size.

2. Absorbent body according to Claim 1, c h a r a c t e r i z e d in that the first and/or the second absorbent structure comprises hydrophilic fibre material.

3. Absorbent body according to Claim 1 or 2, c h a r a c t e r i z e d in that the first and/or the second absorbent structure comprises polymer foam material.

4. Absorbent body according to one or more of the preceding Claims, c h a r a c t e r i z e d in that the liquid acquisition portion (13; 11, 13) has a lower density than the liquid storage portion (12).

5. Absorbent body according to Claim 2, c h a r a c t e r i z e d in that the liquid acquisition portion (13; 11, 13) has a density of 0.02-0.2 g/cm^3, preferably

between 0.06-15 g/cm^3, and the liquid storage portion (12) has a density of 0.1-1.0 g/cm^3, preferably between 0.12-0.6 g/cm^3.

6. Absorbent body according to Claim 2, 4 or 5, c h a r a c t e r i z e d in that the fibre material in the liquid acquisition portion (13; 11, 13) has an open fibre structure and a low liquid dispersability, and that the fibre material in the liquid storage portion (12) has a higher liquid dispersability than the fibre material in the liquid acquisition portion (13; 11, 13).

7. Absorbent body according to Claim 6, c h a r a c t - e r i z e d in that the major portion of the fibre material in the liquid acquisition portion (13; 11, 13) is mechanical pulp, thermo-mechanical pulp, chemo-thermo-mechanical pulp, pulp of chemically stiffened cellulose fibres, synthetic fibres or mixtures thereof.

8. Absorbent body according to one or more of Claims 4-7, c h a r a c t e r i z e d in that the major portion of the fibre material in the liuqid storage portion (12) is chemical pulp.

9. Absorbent body according to one or more of Claims 4-7, c h a r a c t e r i z e d in that the major portion of the fibre material in the liquid storage portion (12) is dry formed sheet pulp.

10. Absorbent body according to one or more of the preceding Claims, c h a r a c t e r i z e d in that the liquid acquisition portion (13; 11, 13) contains between 0 and 30%, preferably between 2 and 15%, of super-absorbent material computed on the total dry weight of the portion.

11. Absorbent body according to one or more of the preceding Claims, c h a r a c t e r i z e d in that the liquid storage portion (12) contains between 2 and 80%, preferably between 10 and 50%, of superabsorbent material computed on the total dry weight of the portion.

12. Absorbent body according to Claim 1, c h a r a c t - e r i z e d in that the liquid storage portion (12) consists of a layer of superabsorbent material in particle form.

13. Absorbent body according to one or more of the preceding claims, c h a r a c t e r i z e d in that it comprises two or more wells (13) distributed over the assumed wetting area of the absorbent body.

14. Absorbent body according to one or more of the preceding Claims, c h a r a c t e r i z e d in that the liquid acquisition portion comprises a cover layer (11) which covers at least substantial portions of the liquid storage portion (12).

15. Absorbent body according to Claim 14, c h a r - a c t e r i z e d in that the cover layer (11) of the liquid acquisition portion and the well (13) are integrated with each other and consist of the same type of material.

16. Absorbent body according to Claim 14, c h a r - a c t e r i z e d in that the cover layer (11) of the liquid acquisition portion and the well (13) consist of different types of material.

17. Absorbent body according to Claim 15 or 16, c h a r a c t e r i z e d in that the cover layer (11) has a portion (11b) adjacent to the well (13), said

portion having a higher density than the adjacent portions of the cover layer (11a).

18. Absorbent body according to Claim 17, c h a r - a c t e r i z e d in that the cover layer (11) in the rear portion (11a) of the absorbent body as seen in the position for use, has a lower density than said more compressed portion (11b) and that said rear portion (11a) is separated from the well (13) by means of a margin of said more compressed portion (11b).

19. Absorbent body according to Claim 18, c h a r - a c t e r i z e d in that said margin (11b) has a dimension in the longitudinal direction of the absorbent body of between 5 and 50 mm.

20. Absorbent body according to one or more of the preceding Claims, c h a r a c t e r i z e d that between the well (13) and the storage layer (14), there is arranged a layer (19) of a material with high liquid absorption capacity and wet resiliance, or alternatively capacity to swell in wet state, e.g. synthetic fibre material, polymer foam material, cellulose fibres of mechanical, thermo-mechanical or chemo-thermo-mechanical pulp, pulp of chemically stiffened cellulose fibres or dry formed compressed sheet pulp.

21. Absorbent product such as a diaper, incontinence protector, sanitary napkin or the like, and comprising an absorbent body according to one or more of Claims 1-19 enclosed between a liquid permeable jacket (3) and a liquid impermeable jacket (2).

AMENDED CLAIMS

[received by the International Bureau on 29 May 1995 (29.05.95);
original claims 1,2 and 3 amended; remaining claims unchanged.
(1 page)]

1. Absorbent body in an absorbent product, such as a diaper, incontinence pad, sanitary napkin or the like, said absorbent body comprising a liquid acquisition portion (13; 11, 13) and a liquid storage portion (12) adjacent thereto, c h a r a c t e r i z e d in that said liquid acquisition portion comprises at least one well (13) located at the expected wetting area of the absorbent body, said well extending depthwise into and through the liquid storage portion (12) and is in liquid communication with a liquid wicking layer arranged under the liquid storage layer (12), that in the liquid storage portion (12) there is arranged a first absorbent structure which has a first effective mean pore size and that in the liquid acquisition portion including the well(s) there is arranged one or more second absorbent structures, each having an effective mean pore size, which is larger than the first mean pore size.

2. Absorbent body according to Claim 1, c h a r a c t e r i z e d in that the first and/or the second absorbent structures comprise hydrophilic fibre material.

3. Absorbent body according to Claim 1 or 2, c h a r a c t e r i z e d in that the first and/or the second absorbent structures comprise polymer foam material.

4. Absorbent body according to one or more of the preceding Claims, c h a r a c t e r i z e d in that the liquid acquisition portion (13; 11, 13) has a lower density than the liquid storage portion (12).

5. Absorbent body according to Claim 2, c h a r a c t e r i z e d in that the liquid acquisition portion (13; 11, 13) has a density of 0.02-0.2 g/cm^3, preferably

STATEMENT UNDER ARTICLE 19

Claim 1 has been amended to correspond with the amended Claim 1 filed with a response in the Swedish priority application. The last 7 lines of the Claim have been rewritten to clarify that the well(s) are not empty and that the liquid acquisition portion and the well(s) included therein can contain more than one absorbent structure, each having a larger pore size than the pore size of the structure in the liquid storage portion. The fact that the liquid acquisition portion and the well(s) included therein can contain one or more absorbent structures is clear from Claims 15 and 16.

Claims 2 and 3 have been amended to correspond with the new Claim 1.

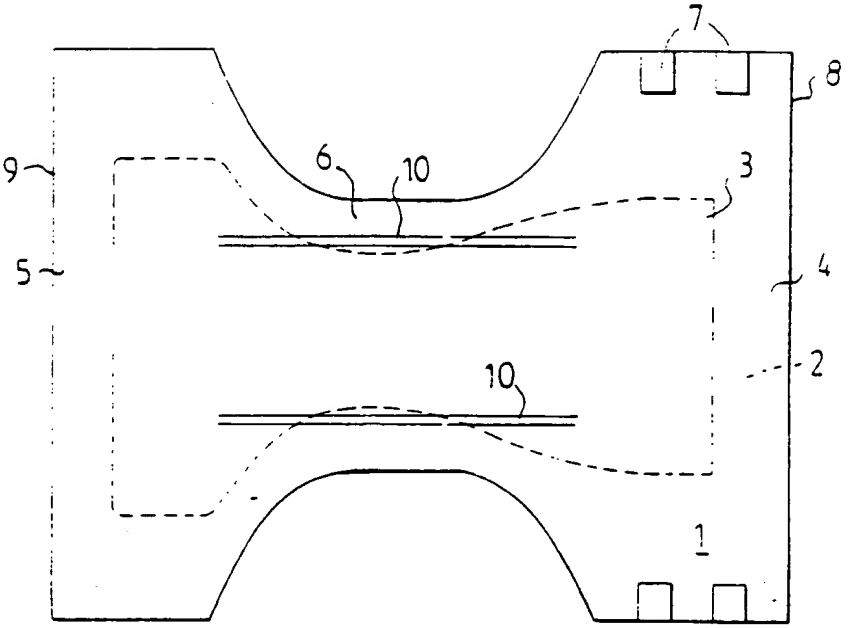

FIG. 1

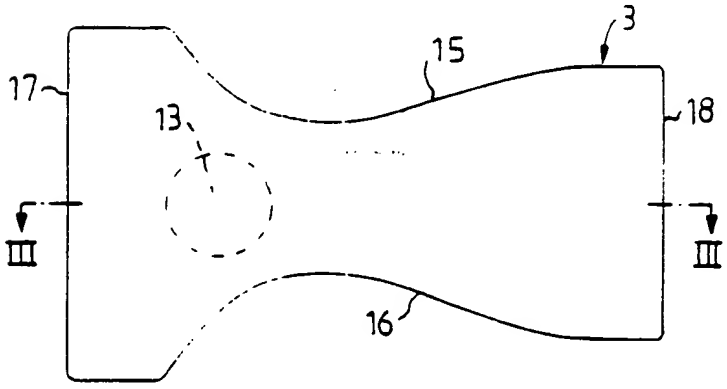

FIG. 2

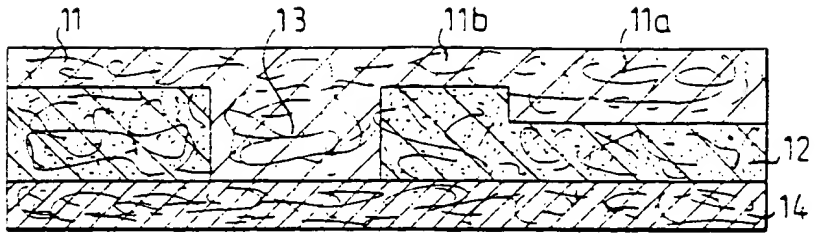

FIG. 3

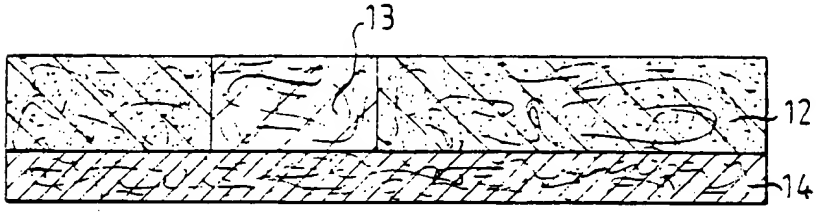

FIG. 4

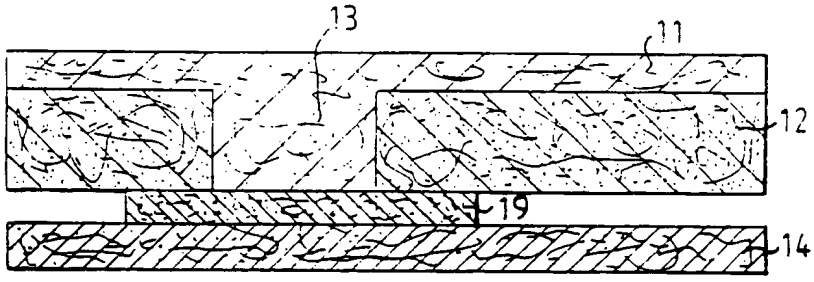

FIG. 5

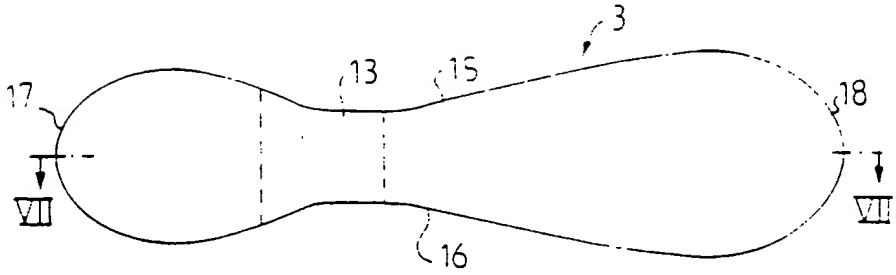

FIG.6

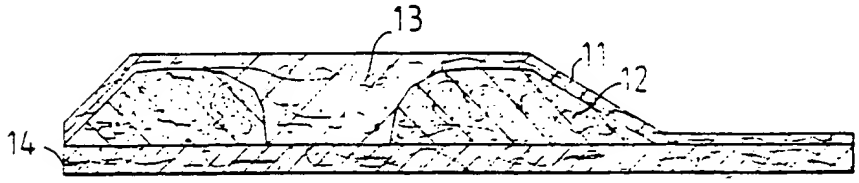

FIG.7

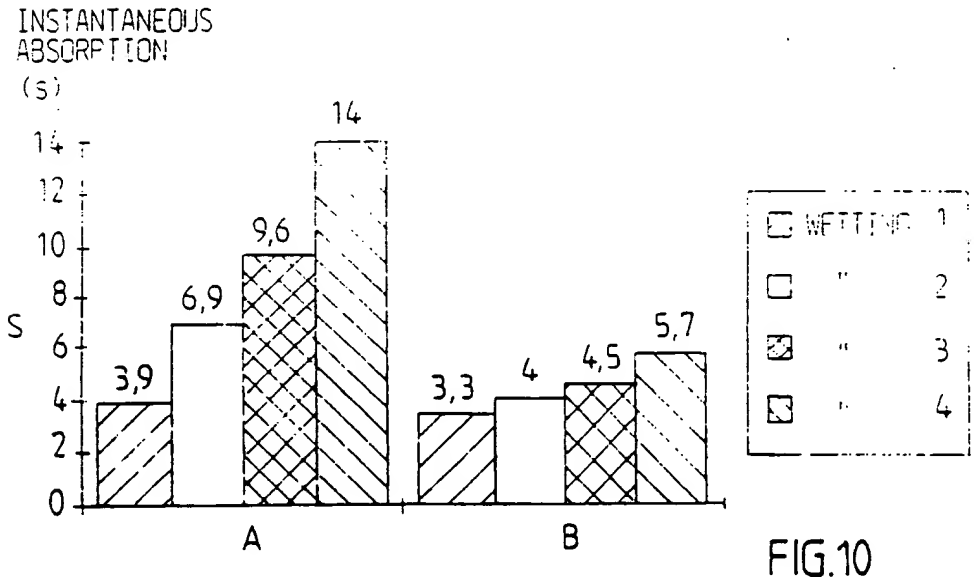

FIG.10

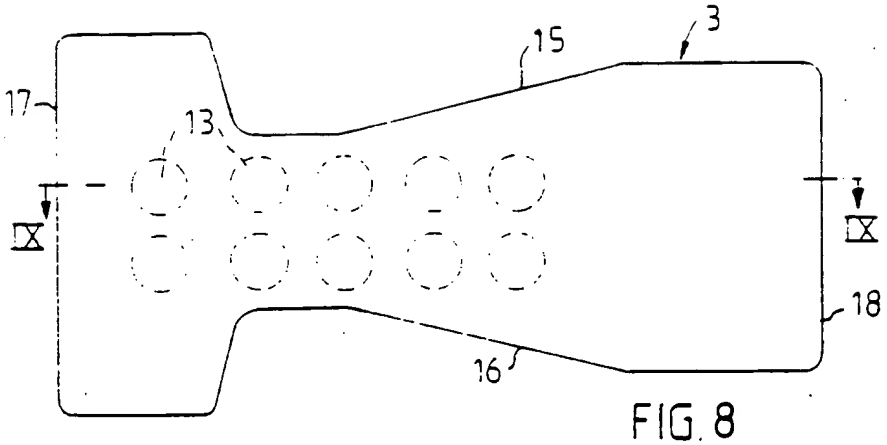

FIG. 8

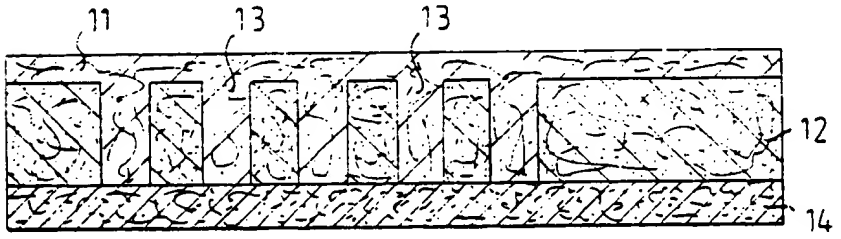

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 94/01259

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61F 13/15
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SE, B, 427985 (PIERRE FRANCO), 30 May 1983 (30.05.83), page 2, line 38 - page 3, line 2; page 3, line 25 - line 32, figure 2	1-21
A	EP, A1, 0354196 (MÖLNLYCKE AB), 7 February 1990 (07.02.90), column 3, line 21 - line 32	1-21

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" erlier document but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 March 1995	13 -04- 1995
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer May Hallne Telephone No. +46 8 782 25 00

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INTERNATIONAL SEARCH REPORT
Information on patent family members

25/02/95

International application No.
PCT/SE 94/01259

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-B- 427985	30/05/83	BE-A- 853933	25/10/77
		CA-A- 1115452	05/01/82
		CH-A- 611154	31/05/79
		DE-A,C- 2718344	22/12/77
		FR-A,B- 2354753	13/01/78
		GB-A- 1560151	30/01/80
		JP-A- 52152694	19/12/77
		NL-A- 7704498	16/12/77
		SE-A- 7704751	15/12/77
		US-A- 4184498	22/01/80
EP-A1- 0354196	07/02/90	AU-A- 3856089	23/01/90
		SE-B- 461440	19/02/90
		SE-A- 8802448	30/12/89
		WO-A- 9000041	11/01/90